

We claim:

1. A process for a manufacturer to obtain customer orders for custom-designed biochips in an automated process, comprising obtaining desired target sequence(s) from the customer, wherein the target sequence(s) consist essentially of oligonucleotide sequences, 5 polypeptide sequences, receptor binding site, or antigens to be bound; creating a sequence content motif for an array, wherein the sequence content motif consists essentially of oligonucleotide sequences, polypeptide sequences, or binding agents designed for complimentary binding; and applying the sequence content motif to a surface or within a porous matrix of a volume, suitable for later detection according to the sequence content motif, wherein the communication from the 10 customer and the sequence content motif of each custom-designed biochip is retained within a storage device of the manufacturer.

2. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 1 wherein the desired target sequences are obtained from a database of sequences.

3. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 2 wherein the database of target sequences is selected from the group consisting of GenBank, TIGR, Incyte database, private databases and combinations thereof.

4. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 1 wherein the step of creating a sequence content motif comprises developing binding regions between a target sequence and a designed capture probe sequence according to consistent reaction conditions, wherein the reaction conditions include temperature and pH.

5. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 1 wherein the detecting step comprises exposing the custom-designed biochip to a sample to form an exposed custom-designed biochip, and either detecting binding with an instrumentation system designed to obtain a result at each site in a custom-designed biochip to obtain custom-designed biochip exposed data, or shipping the exposed custom-designed biochip back to the manufacturer to determine custom-designed biochip exposed data.

6. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 5 wherein the custom-designed biochip exposed data is analyzed by computer 30 using a comparison to the sequence content motif for an array.

7. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 1 wherein the surface or the volume on which or within which a sequence content motif is applied is a selected from the group consisting of a solid non-porous surface, a silica-based surface, a porous matrix surface, a porous volume, a polysaccharide-based surface and 35 layer, glass, and combinations thereof.

8. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 1 wherein the means for applying sequence content onto the surface or within the volume according to the content motif designed is selected from the group consisting of spotting oligonucleotides or polypeptides or *in situ* synthesis of oligonucleotides or polypeptides, photolithography of oligonucleotides or polypeptides or *in situ* synthesis of oligonucleotides or polypeptides, electrochemical-based pH changes *in situ* synthesis of oligonucleotides or polypeptides, photochemical-based pH changes for *in situ* synthesis of oligonucleotides or polypeptides, and combinations thereof.

9. The process for a manufacturer to obtain customer orders for custom-designed biochips of claim 1 wherein the surface on or volume in which a sequence content motif is applied is selected from the group consisting of a solid non-porous surface, a silica-based surface, a porous matrix, a polysaccharide-based surface and layer, glass, and combinations thereof.

10. A system for a manufacturer to obtain customer orders for custom-designed biochips comprising a network-based receiving station for a manufacturer to receive desired target sequences from the customer, wherein the target sequences consist essentially of oligonucleotide sequence(s), polypeptide sequence(s), receptor binding site(s), or antigen(s) to be bound on a surface or within a porous matrix of a volume, or both; a software means for creating a sequence content motif for an array, wherein the sequence content motif consists essentially of oligonucleotide sequences, polypeptide sequences, or binding agents designed for complimentary binding; and a manufacturing system for applying the sequence content to a surface or within a volume or both, suitable for later detection according to the sequence content motif.

11. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 10 wherein the software means designs sequence content motif for binding to target of oligonucleotide sequence(s), polypeptide sequence(s), receptor binding site(s), or antigen(s) according to uniform melting temperatures, pH, environment, stringency conditions, or other conditions for consistent affinity binding of oligonucleotide sequence(s), polypeptide sequence(s), receptor binding site(s), or antigen(s).

12. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 10 wherein the system further comprises instrumentation for detecting binding of a sample onto the custom-designed biochip to generate exposure data, wherein the instrumentation resides at the customer or the manufacturer, at a third part or at multiple locations.

13. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 12 wherein the system further comprises the network or a new network for transmitting data showing binding on the custom-designed biochip to the manufacturer or designee for analysis of the sites according to the sequence content motif.

14. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 10 wherein the sequence content motif of each custom-designed biochip is retained within a storage device at the manufacturer.

15. The system for a manufacturer to obtain customer orders for custom-designed
5 biochips of claim 10 wherein the desired target sequences are obtained from a database of sequences.

16. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 15 wherein the database of target sequences is selected from the group
10 consisting of public databases, private databases, GenBank, TIGR, Incyte database, private databases and combinations thereof.

17. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 10 wherein the creation of content according to the sequence content motif comprises developing binding regions between a target sequence and a designed capture probe sequence according to consistent reaction conditions, wherein the reaction conditions include
15 temperature, pH, stringency, ionic strength, hydrophilic or hydrophobic environment, and combinations thereof wherein a software program having melting temperature, stringency and proton (pH) chemistry algorithms is employed.

18. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 10 wherein the detecting step that exposes the custom-designed biochip to a sample to form an exposed custom-designed biochip, and either detecting binding with an instrumentation system designed to obtain a result at each site in a custom-designed biochip to obtain custom-designed biochip exposed data, or shipping the exposed custom-designed biochip back to the manufacturer to determine custom-designed biochip exposed data.

19. The system for a manufacturer to obtain customer orders for custom-designed
25 biochips of claim 18 wherein the custom-designed biochip exposed data is analyzed by computer using a comparison to the sequence content motif for an array data as a template.

20. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 10 wherein the surface or volume having a porous matrix on which a sequence content motif is applied is a selected from the group consisting of a solid non-porous surface, a
30 silica-based surface, a porous matrix, a polysaccharide-based surface and layer, glass, and combinations thereof.

21. The system for a manufacturer to obtain customer orders for custom-designed biochips of claim 10 wherein the means for applying sequence content onto a surface or within a porous matrix of a volume, or both, according to the motif designed, is selected from the group
35 consisting of spotting oligonucleotides or polypeptides or *in situ* synthesis of oligonucleotides or polypeptides, photolithography of oligonucleotides or polypeptides or *in situ* synthesis of

oligonucleotides or polypeptides, electrochemical-based pH changes *in situ* synthesis of oligonucleotides or polypeptides, photochemical-based pH changes for *in situ* synthesis of oligonucleotides or polypeptides, and combinations thereof.

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